DOCUMENT RESUME

ED 058 960 PS 005 378

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TITLE An Early Intervention Program for Two Year Old Children.
PUB DATE Sep 71
NOTE 24p.; Paper presented at the 79th Annual Convention of the American Psychological Association, Washington, D.C., September 3-7, 1971

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS *Behavior Development; Caucasians; Classification; Cognitive Processes; Data Analysis; Diagnostic Teaching; Early Childhood; Economically Disadvantaged; Educational Programs; Hypothesis Testing; *Intervention; Literature Reviews; Middle Class; Negroes; Nursery Schools; Parent Child Relationship; *Preschool Children; Research; Symbolic Language; *Symbolic Learning; *Thought Processes

ABSTRACT

This document presents some of the major challenges facing Developmental Psychologists. Research revealed that middle class children tended to respond in classification tasks to objects and pictures as equivalents, whereas low class black children tended not to do so. The reason for this was investigated. This investigation of the course of development of representational thinking is of import for theoretical and practical reasons: (1) to enhance understanding of a crucial cognitive phenomena, and (2) to provide diagnostic and remediational procedures to insure continued growth and mastery of symoblic activities. Examination of the literature and of parent child data suggested that the children from impoverished environments had less experience in utilizing those processes that are inherent in representational thought, i.e., anticipation, planning, articulation of events in linguistic terms, etc. The basic hypothesis emerged that exposing children to distancing behavior should enhance the development of representational skills. The decision was made to work with two-year-olds in a nursery-school-type setting to give them a chance to engage in representational thought. It became clear very early in the program that the children could and did engage in group-type behaviors and were increasingly involved in a small group setting. (CK)

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An Early Intervention Program for Two Year Old Children

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What I wish to do in this report is use my own experience as Director of an Early Childhood Education Project to highlight what I believe are some of the major challenges facing Developmental Psychologists to date. At issue is the choice to investigate a significant problem in the context of a nursery school environment with a child of particular age and social status. The decision to select a nursery rather than other options will be discussed later.

Before I get the cart too far before the horse, let me begin at the beginning and unfold the story - which in effect, can be defined as the trials and tribulation of jousting with real windmills.

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Conceptual Framework

About five years ago, I began a research program to investigate cognitive style and classification behavior in young black children. The significance of cognitive style, that is, the mode by which children organized and arranged arrays of familiar material was identified (Kagan, Moss & Sigel, 1963; Sigel & Jarman, 1967; Sigel, 1970), and further having already identified the type of logical structure these could use in free sort and matrix

problems, one phenomenon became patently clear, namely preschool and kindergarten black children had more difficulty classifying pictures of familiar objects as compared to three dimensional counterparts. Further, when these children did group objects in a free sort, the criteria for grouping tended to be on the basis of a restricted functional (basis,)rarely implying structural part whole relationships, and narrow in terms of conceptual breadth. Such differences were in fact, less surprising than the discrepancy in their grouping behavior with 3D objects compared to color life-sized photographs.(Sigel & McBane, 1967; Sigel & Olmsted, 1970; Sigel & Olmsted, 1970). Replications of these earlier studies yielded similar studies. In effect, I felt that a significant number of lower class black children had more difficulty in dealing with representational material. This, in spite of the fact that they could label the pictorial material with 100% accuracy. Short term training studies were employed attempting to eliminate or at least reduce the discrepancy but to no avail. In other words, where middle class children (white and black) tended to respond in classification tasks to objects and pictures as equivalents, the lower class black children tended not to do so.

This persistent finding nagged me. After all, the realization that objects and their pictorial counterparts can be construed as equivalent, and that pictures are representations (albeit

morphological ones) of objects is an elementary and critical cognitive task in development of symbol and signs. The concept of equivalence is taken essentially from Klüver, who wrote "not withstanding certain changes in the stimulus situation the stimuli are in some way "identical" or similar: they call forth the same "response"; they are from the point of view of reaction produced equivalent" (Klüver, p.4).

The fact that the children responded equivalently on the recognitory level but not functionally in regard to classification behavior, raises the major question - why not?

The search for answer in the research literature was to no avail. I say this in spite of the assertion that children can match two dimensional drawings representing three dimensional objects (Reese & Lipsitt, 1971). The study by Hochberg and Brooks (1962) for example, report that a child reared for the first 19 months of life with minimal experience which pictures and photographs of objects had no difficulty in recognizing objects in photographs and pictures. The issue is not in the recognition which may be on observable morphological similarly. Rather, the issue is does the child recognize that the object is and can be represented in another mode still be a member of the same conceptual class. These studies confused recognition with "knowing" and an affect. Sure children can recognize a picture,

but the understanding that this picture is equivalent to its physical pictured counterpart, is not necessarily present. If one argues that this phenomenon is a symptom of lack of conceptual ability or I.Q., as has been done, one is still left with a statement of an explanatory principle.

The phenomena was defined as representational competence, meaning the competence to respond to stimuli in various representational presentations, e.g., object-pictures. In a sense, it is the competence to respond to stimuli in terms of an equivalence principle (Sigel & McBane, 1967).

Having failed to find solace in the research literature, I was thrown back on the theoretical writing of Piaget, Werner, Cassirer among others as potential sources of explanation. The generic problem from a developmental perspective is the understanding of the development of representational competence.

It may well be that representational competence is one reason lower class black children have difficulties in conceptual and symbolic thinking in elementary school.

The investigation of the course of development of representational thinking is of import for theoretical and practical reasons; on a theoretical grounds to enhance our basic understanding of a crucial cognitive phenomena, and on practical grounds, to provide diagnostic and remediational procedures to insure continued growth

and mastery of symbolic activities.

In our previous research, representational competence was operationally defined in terms of responses to classification tasks. Are the results obtained due essentially to particular experiences with pictures or do they reflect a more generalized phenomena? To answer these questions necessitated conceptualizing representational thinking, and thereby assessing what kinds of phenomena can be subsumed under that rubric. The concept "representation" is an ambiguous term in English since it refers to internal mental reconstructions of reality, e.g., image and to an external phenomena, e.g., a picture. We examined a number of tasks which involved external representational stimuli, e.g., drawings, photographs, linguistic tasks, each involving references to see how children used these "internal" guides in solving problems involving the use of gestures, memory, etc. Consistently lower class children had more difficulty (Sigel & Olmsted, 1970b).

Representation is involved in such activities as anticipation of events or actions, as outcomes, reconstruction of past experiences, objectification of reality and self, inferring relationships of cause-effect, especially of discrete events. Further, the awareness that objects (social and non-social) and events can be depicted in various media speaks to the convergence between the internal awareness and the external responsiveness.

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Lower class black children had significantly more difficulty in many areas involving representation in contrast to their middle class counterparts. Why? What might be the necessary and sufficient condition that produce representational competence?

Accepting the assumption that representational competence is generic human ability, and assuming further that activation of this competence is an outcome of particular class of life experiences, led to an examination of socializing experiences that facilitate or preclude adequate establishment of representational competence. These exerpiences deemed most relevant are those that would involve orientation to the social and non-social environment in such terms as anticipation, objectification of temporal, spatial, and causative factors.

Examination of the literature, as well as our own parent child data suggested that these children from impoverished environments had less experience in utilizing those processes defined earlier as part and parcel of representational thought - i.e., anticipation, planning, articulation of events in linguistic terms, etc. Could it be that such limited experience inhibited the course of growth of representational skills? What functions do such behaviors serve?

The argument developed that certain classes of socializing experiences function to "demand" employment of representational

activity. It may well be that necessary and/or sufficient conditions that set the processes involving representational competence in motion are those that serve to create psychological spatial, temporal distance between person and object. These behaviors are referred to as distancing behaviors, e.g., the class of events which create psychological distance between ostensive reality and its reconstruction (Sigel, 1970). The review of interview and test data strongly supported the contention that there were significant differences in the experiential world of lower and middle class children in this regard.

Thus, the basic hypothesis emerged - namely that exposing children to distancing behavior should enhance the development of representational skills.

Distancing behaviors, however, will only be effective stimulants if the recipient is motivated to engage and to interact with the significant person or event where exposure without prerequisite willingness or activity to participate in that enjoyment precludes any effect.

Cognitive outcomes of "distancing" experiences must be conceptualized in the context of the affective relationships. To isolate cognitive development from affective involvement is an artificial fragmentation of person and social context.

The next question was, is there a period when such experiences

would be of more moment than others, and 2) under what conditions?

The answer to the first question came, at least on theoretical grounds from Piaget who describes in some detail the transitional period between the sixth stage of sensori-motor period and the beginnings of the pre-operational thought - somewhere between age 18 months and 24 months (Piaget, 1950; Inhelder & Piaget, 1964). If the argument is accepted that development is cumulative and further, if particular experience at one period influences the direction developments takes at subsequent periods, it may well be that how the child passes through the transition period sets the tone for subsequent development. Thus, the decision to work with 2 year olds. Now the child is beginning to utilize language, locomote freely on the upright, etc. Enhancing the transition in terms of appropriate environmental support is a vital consideration.

The decision as to age level then, led to the next question, under what conditions? The choices are basically between individual and group type settings. I opted for the latter in spite of the dearth of information about group educational programs for two year old children. The appropriateness of a group setting was based on a number of premises both theoretical and practical. First, I believe cognitive growth eminates from a broad experiential base, with experiences in various contexts and various materials. A nursery school type setting becomes relevant. A

nursery school in addition, provides a more intensive and cumulative contact with the social and non social environment than can occur at home. Finally, it provides the opportunity for setting up a sequential set of experiences not only to help acquire the experience, but also to reinforce already acquired gains.

On the other hand, this is obviously not the neatest experiment simply because the usual complexity of variables come into play, precluding to some degree the identification of the particular prominent variable which play significant and consistent role.

The most important factor probably in finalizing the decision is the conviction that intervention is a complex matter requiring intensive and persistent experiences of many kinds. The manipulative limitations of the single variable experiment leaves much to be desired in terms of considering the complexities that seem to play a prominent role in development. Finally, and not to be overlooked is the contribution that can be descriptive data of children of this age. We know so little about children at this period and what we know is so questionable, in fact, perhaps one can speak of the myth of two year olds?

Given that decision and aware of the numerous problems facing us, the design is essentially a pre post, with continuous monitoring of ongoing behaviors.

Assessment of Program

As to pre-post measures, 25 were selected as assessing various facets of representational thought. These include anticipation, reasoning, deferred imitation and memory. What was frustrating, was the dearth of measures available for many of these factors in the literature. So, aside from borrowing what we could, we had to make up many.

The test battery was selected to assess performance relative to representational competence. Since performance is not independent of the child's affective state and mode of representation, our assessment procedure involved three types of behaviors;(1) mode of representation, response to objects, pictures, etc.; (2) problem solving tasks, e.g., classification, seriation, analytic and reasoning skills, number and spatial concepts, etc., and (3) attendant behaviors in terms of attending to the task, persistence, help seeking, etc, were recorded. These three areas in fact, are conceptualized as interacting, and performance is considered as a resultant of at least these three domains.

We did find that for this age children, we could carry out an assessment program, but there was considerable variability not only in performance, but in ability of children to relate in the situation. It was found that performance levels of children were better if they were expressive and outgoing than if they were shy and withdrawn.

The assesement went on while the children were enrolled in the program. Thus, they were familiar with examiners and with the situation.

The next task, for us developing a day to day program.

Educational Program

The curriculum was operationalized into units that involved modes of representation and cognitive operations. The modes of representation began with imitation, followed by deferred imitation, symbolic play, graphic and linguistic expression. The cognitive operations were classification, seriation, space relationships, cause-effect, number.

Although there is reputed to be a sequential development in terms of competence in dealing with various modes of representation it appears that children did show varying competencies at various levels. Further, competence in mode of representation varied with the materials involved. When playing in the doll corner, most children could engage in relatively complex and sustained symbolic play; the same type of behavior was not manifest in building with blocks or construction with sand table. The structure of the material and the proximity to their own experience influenced play behaviors.

Nevertheless, it became clear that very early in the program the child could and did engage in group type behaviors and were increasingly involved in a small group setting. Initially, the

teacher always had to be present and active in the group. However, we discovered that mid-year the teacher could leave the group and the activity would be sustained. What tended to contribute to the small groups disintegration was interpersonal conflict - which the children could not resolve.

We set up activity settings - doll corner, sand table, large block and manipulative activity and small table activity - at times paint corner was added. A teacher was stationed at each of these areas. In this way groups formed and carried on sustained play.

The teacher's behavior in each of these contexts varied in part with the media involved but also there was to be considerable overlap. The overlap was particularly in terms of "distancing behaviors" - e.g., "What happened to ---" These efforts are presumed to be multiple in their effect - first language is elicited as a medium referring to previously experienced actions or to anticipated outcomes and this contributes to establishing a relationship between child, teacher and events.

In order for these groups to function, a large proportion of the teachers' time involved managerial techniques. For us, an important issue is the coherence between disciplinary procedures and cognitive objectives. Yet, few if any, projects discuss in detail the child management "techniques", nor do they assess the

relationship between such techniques and outcomes. This is another void, in our knowledge base regarding cognitive development.

Yet, it seems reasonable to suppose that how the group is managed by the teacher, how the children are individually treated, how deviant behaviors are managed not only influences relationships between teacher and child, but also between children. These relationships can be so defined as a function of how control techniques are employed to ensure the hoped for cognitive gains. There is, I believe a sensitive balance between social control, interpersonal relationships and cognitive growth.

The control techniques focused on, came from research conducted years ago at Merrill-Palmer (Hoffman, 1960 , Sigel, 1960). Expressions of arbitrary here and now decisions to self directed compliance were the criteria for systemization of techniques parents use to modify the ongoing behavior of their children. These parent behaviors were designated as <u>influence techniques</u>. Analysis of these, indicated the relevance to distancing. For example, using alternative with planning, e.g., "You must stop now, but you may do it in a while" is an example. The latter type being consistent with distancing behaviors, were the techniques of choice anticipation was possible.

Thus, the "teaching" strategies had to encompass a social-emotional as well as cognitive consideration. It had to encom-

pass "teaching" not only cognitive matters but socialization as well. I am surprised in and in a sense, perplexed in reviewing reports of many preschool intervention programs that very few bring this managerial issues into sharp focus. It is as though children just go happily to school, don't fight, always cooperate, etc. We were not so lucky. We had to cope with biting, fighting, tantrums, etc.

The complexity of our task has become patently clear by this time. The creation of a quasi naturalistic setting in which to study the effect of a particular intervention strategy was deliberate. The challenge of course, is to demonstrate not only the feasibility of working with two year olds in a group "educational setting", but also can the basic hypothesis of the project be tested.

I was interested not only in particular changes before and after very gross change measures, but also in shorter range changes. Further monitoring activities during the course of the year provide data which might help explain or account for such changes.

After a year we have learned much about the children, in the setting and I would like to turn now to a few highlights here.

Some tentative impressions and results: First, I believe our literature on children at this age is more myth than reality.

On the social side, the children could and did function in group settings, manifested interest and cooperation with others. Attention span and distractability were variable, but with sufficient frequency to dispel the oft held generalization that is inevitably short.

Second, sex differences in play behaviors and interest patterns were already evident with indication of sex role differentiation appearing very early for these children.

Third, monitoring the teachers' behaviors by time sample observations revealed that our teachers in our program did use some different strategies than in other programs and these are consistent with our objectives.

Fourth, the collection of data for year one, is complete and being analyzed. I am most impressed with the complexities of behavior manifest by children in this age - where their performance is comparable for the most part with more privileged children. Our children will stay in the program, hopefully until they reach kindergarten. Thus, we will be able to assess cumulative effects. A very needed body of data.

Fifth, we were impressed with the cognitive complexities manifest at this age and with these children. Again the variability is considerable.

I would like to turn now to a discussion of one particular

task that I believe revealed much fascinating information, while simultaneously revealing how little we are aware the processes involved in knowledge acquisition. This is the classification tasks described by Inhelder and Piaget in Early Growth of Logic, (1964). Aside from Henry Riccuiti at Cornell University, I know of no other detailed studies of object sorting or categorization behavior of children as young as 24 months (Riccuiti, 1965).

The children were administered three free sorting tasks each containing an array of various shaped, sized and colored blocks. The instructions were the same Inhelder and Piaget used (1964).

The performance was video taped and we are currently analyzing these records. The categories we generated were derived from intensive examination of these tapes. Our interest is in the process employed in the service of creating a product. Thus, a process analysis is done recording each of steps employed.

Five categories are used: non-grouping, where children touch, bang, etc.; grouping, where objects are combined in a distinct group - stacking, vertical alignments, etc.; decision-making - these involve behaviors evidenced in the process of working with the materials, e.g., hesitation, replacements, etc. Symbolic production and presentations complete the test - where

symbolic productions are those which are labelled or clearly indicative of a representation. Presentation are usually associated with indicating that the final product is complete and it is presented to the examiner.

Careful observations reveal that children show more variability in how they work than what they produce. Most of the children stack blocks, in a serial order, have difficulty creating distinctive groups, be they stacked or not, have structures and enclose space, as if space is to be filled.

In the pretesting we were able to delineate three stages, the first two seem to precede those graphic collections described by Inhelder and Piaget (1964).

Stage I, no grouping behaviors. Blocks are held, banged, inserted on arms or other body parts. There is no apparent matching or touching, or organization that indicates awareness of similarity or collecting items on any basis.

State II. Beginning of collecting some items on the basis of some criterion (usually form). Only part of the array is employed. Groups are not separated - rather stacking, for example, is continuous if and when all blocks are used. An example is an array of small rings, and small rectangles. A frequent response to this is to stack the rings, then stack the rectangles

on top of them. Some time the rings can be stacked on the basis of color, exhausting colors, etc.

State II children seem to need to fill space, when it is the space in a ring or space on the table.

State III groups (be they stacked or aligned horizontally), are separated, products are identified, and there is no bunching of the separate productions.

These stage designations tend to encompass the range of the child's behavior. Some overlaps are evident, e.g., between Stage II and Stage III, and these we refer to as transitional.

Our initial analysis indicated that children could be readily classified within these stages.

Of particular interest are some of the improvements in performance and some of the processes involved. Stacking behavior is a most frequent response - which for me, suggests an egocentric (in the Piagetian sense) response. The child creates vertical structures - vertical to his own relatively recent acquisition of verticality. Not creating more than one structure may be indicative of an action dominated process - where once the actions commence, the children persevere. It is as if there is no internalized scheme or plan. The performance is almost a vertical chaining.

In the pretest performance most children were in Stage I or Stage II; in the post test, Stage II and III were evident, with a preponderance of performances at Stage II.

Of particular interest is the frequency of decision making activities where there were indications of mental operations preceeding actions. It is unfortunate that the children were unable to articulate the rationale of their structures and it was not easy to determine whether they were symbolic or just designs. At times, it was easily evident from the nature of the structure or actions the child performed on the materials. Nevertheless, it is clear that much active processing of information goes on - as if there is a rudimentary plan or in effect, some evidence of anticipation and mental operations are evident from two years of age.

Further, we are most interested in relationships between behaviors in various settings. The frequency of lack of consistency between performance in formal testing situations and classroom behavior as well as between behaviors settings, speaks most vividly to the need to examine in depth the relevant environmental dimensions which influence performance. A most dramatic instance of this occurred in the assessment of the child's concept of number. We used the Bailey Infant Test item - the concept

of one. All our children failed this item. However, our observation revealed that many of the children seemed to "know" the concept of one, e.g., the teacher would tell the children to take'one cookie' from a basket, and many did it correctly, or the teacher would ask the child to bring 'one block' and the response would be correct. The question then is, how do we know when the child <u>really</u> knows "something"?

Summary and Conclusions

How can I summarize the excitement and the challenge creation and participation in this program has aroused. There is no doubt in my mind that as psychologists and educators we have much to learn how children learn - particularly with very young ones.

The irony is that we need to learn much more about the children. Reviewing the child development literature, one is struck by the gaps of knowledge at the different age levels. The period of 18 months to 30 months is particularly sparse.

Yet, our experience suggests the viability of engaging these children in psychoeducational programs from which they can profit. To be sure more attention has to be paid to devising means to create an adventitious environment, that structuring and limit setting have greater prominence because of the limited social experiences of the children.

Granted that day care centers have cared for children as

young as those mentioned here, but I am convinced that we can and we should devise more clearly articulated educational programs. The Soviet handbook on early childhood education is an excellent example of how a program can be developed which continuity is cumulative in nature.

For me, the need is for more research investigating the capabilities and developmental patterns in children as yeung as two. Creating group programs with careful observation should contribute immensely to the current and state of of knowledge of the toddler.

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Footnotes

[1]Presidential Address, American Psychological Association, Developmental Psychology, Division 7, Washington, D.C. September 1971.

[2]This project, Early Childhood Education Project is supported by Office of Economic Opportunity, Grant # CG8547.

[3]Participants in the research project are Drs. George Forman and Ada Secrist.